

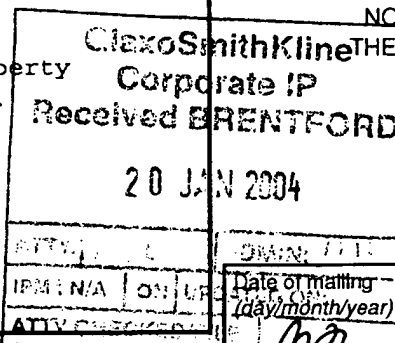
PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

GLAXOSMITHKLINE
Corporate Intellectual Property
Attn. Lubinski, Michael J.
CN925.1
980 Great West Road
Middlesex TW8 9GS
UNITED KINGDOM



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference MJL/B45292	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/EP 02/14902	International filing date (day/month/year) 30/12/2002
Applicant GLAXOSMITHKLINE BIOLOGICALS S.A.	

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



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NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Stefanie B}chler

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MJL/B45292	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 02/14902	International filing date (day/month/year) 30/12/2002	(Earliest) Priority Date (day/month/year) 02/01/2002
Applicant GLAXOSMITHKLINE BIOLOGICALS S.A.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 10 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

PROTEINS OF NON TYPABLE HAEMOPHILUS INFLUENZAE

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
T/EP 02/14902

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 29
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-27 (insofar as they relate to SEQ ID Nos 1 and 2), 28, 30

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 29

Present claim 29 relates to a lipo-oligosaccharide isolated from a mutated ntHi strain in which a gene which is proposed to be involved in LOS biosynthesis is either overexpressed or switched off. The claim implies that lipo-oligosaccharides produced in such a way differ from the lipo-oligosaccharides expressed by wildtype ntHi.

However, the application fails to provide any structural characterization for such lipo-oligosaccharides. It is thus not possible to conduct a search and compare the claimed lipo-oligosaccharides to those already described in the prior art.

In consequence, claim 29 has not been searched.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-27 (insofar as they relate to SEQ ID Nos 1 and 2), 28, 30

Claims relating to Orf1

2. Claims: 1-27 (insofar as they relate to SEQ ID Nos 3 and 4)

Claims relating to Orf2

3. Claims: 1-27 (insofar as they relate to SEQ ID Nos 5 and 6)

Claims relating to Orf3

4. Claims: 1-27 (insofar as they relate to SEQ ID Nos 7 and 8)

Claims relating to Orf4

5. Claims: 1-27 (insofar as they relate to SEQ ID Nos 9 and 10)

Claims relating to Orf5

6. Claims: 1-27 (insofar as they relate to SEQ ID Nos 11 and 12)

Claims relating to Orf6

7. Claims: 1-27 (insofar as they relate to SEQ ID Nos 13 and 14)

Claims relating to Orf7

8. Claims: 1-27 (insofar as they relate to SEQ ID Nos 15 and 16)

Claims relating to Orf8

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

9. Claims: 1-27 (insofar as they relate to SEQ ID Nos 17 and 18)

Claims relating to Orf9

10. Claims: 1-27 (insofar as they relate to SEQ ID Nos 19 and 20)

Claims relating to Orf10

11. Claims: 1-27 (insofar as they relate to SEQ ID Nos 21 and 22)

Claims relating to Orf11

12. Claims: 1-27 (insofar as they relate to SEQ ID Nos 23 and 24)

Claims relating to Orf12

13. Claims: 1-27 (insofar as they relate to SEQ ID Nos 25 and 26)

Claims relating to Orf13

14. Claims: 1-27 (insofar as they relate to SEQ ID Nos 27 and 28)

Claims relating to Orf14

15. Claims: 1-27 (insofar as they relate to SEQ ID Nos 29 and 30)

Claims relating to Orf15

16. Claims: 1-27 (insofar as they relate to SEQ ID Nos 31 and 32)

Claims relating to Orf16

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

17. Claims: 1-27 (insofar as they relate to SEQ ID Nos 33 and 34)

Claims relating to Orf17

18. Claims: 1-27 (insofar as they relate to SEQ ID Nos 35 and 36)

Claims relating to Orf18

19. Claims: 1-27 (insofar as they relate to SEQ ID Nos 37 and 38)

Claims relating to Orf19

20. Claims: 1-27 (insofar as they relate to SEQ ID Nos 39 and 40)

Claims relating to Orf20

21. Claims: 1-27 (insofar as they relate to SEQ ID Nos 41 and 42)

Claims relating to Orf21

22. Claims: 1-27 (insofar as they relate to SEQ ID Nos 43 and 44)

Claims relating to Orf22

23. Claims: 1-27 (insofar as they relate to SEQ ID Nos 45 and 46)

Claims relating to Orf23

24. Claims: 1-27 (insofar as they relate to SEQ ID Nos 47 and 48)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claims relating to Orf24

25. Claims: 1-27 (insofar as they relate to SEQ ID Nos 49 and 50)

Claims relating to Orf25

26. Claims: 1-27 (insofar as they relate to SEQ ID Nos 51 and 52)

Claims relating to Orf26

27. Claims: 1-27 (insofar as they relate to SEQ ID Nos 53 and 54)

Claims relating to Orf27

28. Claims: 1-27 (insofar as they relate to SEQ ID Nos 55 and 56)

Claims relating to Orf28

29. Claims: 1-27 (insofar as they relate to SEQ ID Nos 57 and 58)

Claims relating to Orf29

30. Claims: 1-27 (insofar as they relate to SEQ ID Nos 59 and 60)

Claims relating to Orf30

31. Claims: 1-27 (insofar as they relate to SEQ ID Nos 61 and 62)

Claims relating to Orf31

32. Claims: 1-27 (insofar as they relate to SEQ ID Nos 63 and 64)

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

Claims relating to Orf32

33. Claims: 1-27 (insofar as they relate to SEQ ID Nos 65 and 66)

Claims relating to Orf33

34. Claims: 1-27 (insofar as they relate to SEQ ID Nos 67 and 68)

Claims relating to Orf34

35. Claims: 1-27 (insofar as they relate to SEQ ID Nos 69 and 70)

Claims relating to Orf35

36. Claims: 1-27 (insofar as they relate to SEQ ID Nos 71 and 72)

Claims relating to Orf36

37. Claims: 1-27 (insofar as they relate to SEQ ID Nos 73 and 74)

Claims relating to Orf37

INTERNATIONAL SEARCH REPORT

International Application No

PCT/02/14902

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/285 C07K16/12 C12N9/10 C12N15/31 C12N15/62
C12N5/10 A61K39/102

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EMBL, EPO-Internal, WPI Data, BIOSIS, EMBASE, SEQUENCE SEARCH

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 'Online! 10 February 2001 (2001-02-10) "Pasteurella multocida PM70 section 122 of 204 of the complete genome" Database accession no. AE006155 XP002252628 the whole document	1,2,7-11
X	-& DATABASE SWALL 'Online! 1 June 2001 (2001-06-01) "LosA" Database accession no. Q9CLR6 XP002252629 the whole document --- -/--	1,2,7-11

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

28 August 2003

Date of mailing of the international search report

15. 01. 04

Name and mailing address of the ISA

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Authorized officer

Weikl, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/14902

A(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! 25 June 1996 (1996-06-25) "Haemophilus ducreyi ribosomal protein L31, LOS biosynthesis enzyme LBGA, LOS biosynthesis enzyme LBGB and exonuclease III genes, complete cds" Database accession no. U58147 XP002252630 the whole document</p>	28,30
X	<p>-& DATABASE SWALL 'Online! 1 November 1996 (1996-11-01) "LOS biosynthesis enzyme LBGA" Database accession no. Q47960 XP002252631 the whole document</p>	28,30
X	<p>-& STEVENS ET AL: "Identification of tandem genes involved in lipooligosaccharide expression by Haemophilus ducreyi" INFECTION AND IMMUNITY, vol. 65, no. 2, February 1997 (1997-02), pages 651-660, XP002252627 the whole document</p>	28,30
X	<p>POOLMAN J T ET AL: "Developing a nontypeable Haemophilus influenzae (NTHi) vaccine" VACCINE, BUTTERWORTH SCIENTIFIC. GUILDFORD, GB, vol. 19, 8 December 2000 (2000-12-08), pages S108-S115, XP004227958 ISSN: 0264-410X the whole document</p>	19-21, 25-27
X	<p>KYD J ET AL: "Nontypeable Haemophilus influenzae: challenges in developing a vaccine" JOURNAL OF BIOTECHNOLOGY, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 73, no. 2-3, 20 August 1999 (1999-08-20), pages 103-108, XP004180173 ISSN: 0168-1656 the whole document</p>	19-21, 25-27